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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/585,516

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Shoufu Hou

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EXAMINER

SHUMATE, ANTHONY R

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

06/24/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/585,516	<b>Applicant(s)</b> HOU ET AL.	
	<b>Examiner</b> ANTHONY SHUMATE	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 17-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Summary***

1. This is the initial Office action based on the 11/585,516 application filed 10 July 2006.
2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.
3. Claims 17-31 are pending and have been fully considered.

### ***Oath/Declaration***

4. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:  
The specification to which the oath or declaration is directed has not been adequately identified. See MPEP § 602.

5. Receipt is acknowledged of papers filed under 35 U.S.C. 119 (a)-(d) based on an application filed in China on 9 January 2004. Applicant has not complied with the requirements of 37 CFR 1.63(c), since the oath, declaration or application data sheet does not acknowledge the filing of any foreign application. A new oath, declaration or application data sheet is required in the body of which the present application should be identified by application number and filing date.

### ***Specification***

Art Unit: 1797

6. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

#### ***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 25 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 1797

Relative to claim 25, a broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 25 recites the broad recitation a particle size lower than 0.2 micron, and the claim also recites preferably lower than 0.1 micron which is the narrower statement of the range/limitation.

Claim 31 is indefinite as it is not clear what is meant by "or a preparation process as defined above". It is suggested that this phrase be deleted from claim 31. For purposes of examination, claim 31 has been interpreted as is the phrase was not present.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 17 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by YAMAGUCHI et al. (US 6,228,800 B1).

For instant claims 17 and 30, YAMAGUCHI et al. teaches at the abstract and figure 1 and column 3 lines 26-50 a porous substrate support and a palladium--or palladium alloy--membrane characterized in that the palladium metal substantially exists on the outer surface of the porous substrate support with little presence in the pore channels of the substrate. See also column 6, lines 29-54 of YAMAGUCHI which teaches various forms for the substrate, such as a plate, which would inherently produce a membrane when in its final form.

Also for instant claims 17 and 30, YAMAGUCHI teaches at column 3 lines 26-50 wherein the **thickness** or particle diameter of the carrier is not less than 200 µm. Additionally, YAMAGUCHI teaches at the abstract and column 6 lines 29-54 specific examples of the carrier shape include spheres, ellipsoids, columns, tablets, hollow columns, plates, bars, sheets, honeycombs and the like.

***Claim Rejections - 35 USC § 103***

Art Unit: 1797

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 18, 20, 21, 25-27 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over YOSHIYUKI (JP 04349926) in view of WELLS (US 3,918,927).

For convenience the patent JP 2955062 of the application JP 04349926 will be used as a translation of JP 04349926.

For instant claims 18 and 20 and 21, the subject matter of a properly construed claim is defined by the terms that limit its scope. It is this subject matter that must be examined. As a general matter, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. **Language that suggests or makes optional but does not require** steps to be performed or does not limit a claim to a particular structure **does not limit the scope of a claim or claim limitation** (MPEP 2106).

For instant claims 18 and 20 and 21, it is the examiner's position that the claim language for steps 3 and 7 and the portion of step 2 related to disfigurement are optional and does not limit the scope of the claim based upon MPEP 2106.

For instant claims 18 and 20 and 21, YOSHIYUKI teaches at the abstract electroplating a substrate of porous ceramic with silica gel filled pores with palladium to form a membrane.

For instant claims 18 and 20 and 21, WELLS teaches at the abstract electroplating a substrate which is filled with silica. Also, WELLS teaches at column 3 lines 25-55 [conventional plating processes to produce a plated product having good adhesion of the metal plate thereto. Such conventional plating processes involve a preplating process which includes cleaning; conditioning or etching the surface of the plastic with an acid chromate solution, such as chromic-sulfuric acid, at elevated temperatures; sensitizing the surface of the plastic with an oxidizable salt, such as stannous chloride ( $\text{SnCl}_2$ ), that is absorbed and later reduces the activator (not all conventional processes include this step); activating the surface with a precious metal salt, such as palladium chloride; and electroless plating with either copper (about 0.005 mil to 0.010 mil) or nickel (about 0.010 to 0.030 mil). Each conditioning step is followed by one or more water rinses. The continuous film of electrically conductive material applied by the preplating process provides the capability for applying the final finish by conventional electrolytic processes. Following the preplate process, normal plating of copper-nickel-chrome, or nickel-chrome or any of a whole variety of final finishes, including gold and silver, can be applied by conventional electroplating techniques.]

Therefore for instant claims 18 and 20 and 21, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the conventional electroplating of WELLS to form the electroplated membrane of



Art Unit: 1797

YOSHIYUKI, since WELLS teaches at column 3 lines 25-55 that such a processes provides good adhesion of the metal plate thereto.

For instant claim 25, YOSHIYUKI does not specifically teach wherein the particle size is lower than 0.2 micron. But, YOSHIYUKI teaches at claim 1 of JP 2955062 that the pore diameter of the substrate is 10-10,000Å (0.001-1micron), and that the silica is in the pores. Therefore, for the silica to fill the pores of the substrate the diameter of the filler must be smaller or the same size as the pores of the substrate.

For instant claim 26, YOSHIYUKI teaches at the abstract the surface pore filler is a gel.

For instant claim 27, YOSHIYUKI teaches at paragraph 12 that sol which is a precursor of silica gel, alumina gel, or silica alumina gel maybe used to fill the pores. Also, YOSHIYUKI teaches at paragraph 12 that foaming silica, sintered alumina, mullite, etc. may also be used. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Al-sol, since the species of Al-sol can be clearly envisioned by one of ordinary skill in view of the disclosure of YOSHIYUKI.

Art Unit: 1797

For instant claim 31, implies the substrate is porous ceramics , since YOSHIYUKI teaches at the abstract the porous body is porous ceramic and the body is subjected to surface activating treatment and an electroless plating method.

13. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over YOSHIYUKI (JP 04349926) in view of WELLS (US 3,918,927) as applied to claims 18, 20, 21 and 25-27 above, and further in view of YAMAGUCHI et al. (US 6,228,800 B1).

For instant claim 19, YOSHIYUKI does not specifically teach wherein step 2 is performed under vacuum. But, YAMAGUCHI et al. (US 6,228,800 B1) teaches at column 10 lines 15-25 the pores of the substrate can be filled with air. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to remove the air (i.e. vacuum), so that the air would not inhibit filling the pores of the substrate.

Also for instant claim 19, it is the examiner's position that the claim language for the preferable element and the optional element of claim 19 are optional and does not limit the scope of the claim based upon MPEP 2106.

14. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over YOSHIYUKI (JP 04349926) in view of WELLS (US 3,918,927) as applied to claims 18, 20, 21 and 25-27 above, and further in view of YAMAMOTO et al. (US 3,458,409).

Art Unit: 1797

For instant claim 22, a typical electroless plating solution composition (i.e. something already known) does not patentably differentiate claim 22 from its parent claim.

Also for instant claim 22, YAMAMOTO et al. teaches at the title an electrolyte for thick and brilliant plating of palladium. Also, YAMAMOTO et al. teaches the plating solution of  $\text{Pd}(\text{NH}_3)_2\text{Cl}_2$  dissolved in ammonium hydroxide, and also EDTA-PB if required.

15. Claim 23, 26, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over YOSHIYUKI (JP 04349926) in view of WELLS (US 3,918,927) as applied to claims 18, 20, 21 and 25-27 above, and further in view of BLAHA (US 3,353,982).

For instant claim 23, YOSHIYUKI does not specifically teach subjecting the resulting composite membrane to a post-processing where the pore fillers residing in the pore-channels of the porous substrate are removed or reduced in volume through either heating or physical/chemical dissolving. But, BLAHA teaches at column 1 lines 5-23 membrane with a ceramic substrate similar YOSHIYUKI wherein the pores are filled with whiting. Additionally, BLAHA (US 3,353,982) teaches at column 1 line 69-column 2 line 15 that the ceramic body is treated with a metal film and then the whitening is dissolved from the substrate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the pore filling technique with the similar metal

Art Unit: 1797

coated substrate of YOSHIYUKI, since such a modification would provide the benefit of allowing an even coating of the metal by filling the pores but would allow the pores to be opened to allow an increased transport rate of the separated gas through the substrate.

For instant claims, 26 and 28 and 29 BLAHA teaches at column 1 lines 30-34 that whiting (carbonate colloid) is a powdered form of calcium carbonate (carbonate precipitate).

16. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over YOSHIYUKI (JP 04349926) in view of WELLS (US 3,918,927) and BLAHA (US 3,353,982) as applied to claim 23, 26, 28 and 29 above, and further in view of WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY.

For instant claim 24, YOSHIYUKI and BLAHA do not specifically teaching calcining the substrate. But WEBSTER'S teaches at page 315 column 1 that calcine is to heat in order to drive off volatile matter. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to calcine the composite membrane, since WEBSTER'S teaches at page 315 column 1 that such a modification drives off volatile matter.

### ***Conclusion***

Art Unit: 1797

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A. MAHNEKE (US 6,398,926) Electroplating Apparatus and Method of using the same 4 June 2002.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY SHUMATE whose telephone number is (571)270-5546. The examiner can normally be reached on M-Th 9-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571)272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ROBERT J. HILL, JR/  
Primary Examiner, Art Unit 1797

Application/Control Number: 10/585,516

Page 13

Art Unit: 1797

/A.S./

Examiner Art Unit 1797